^{76}Ge(^{14}N,4nγ),^{73}Ge(^{16}O,p2n) 2009Ru03,2010Ru07

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Alexandru Negret, Balraj Singh	NDS 124, 1 (2015)	30-Nov-2014

2009Ru03: E=44-54 MeV beam provided by Tandem accelerator of IFIN-HH, Bucharest. Measured Eγ, Iγ, nγ coin, $\gamma(\theta)$ using two HPGe detectors.

2010Ru07: E=57 MeV beam provided by Tandem accelerator of IFIN-HH, Bucharest. Measured Eγ, Iγ, nγ coin, $\gamma\gamma$ coin, half-lives and magnetic dipole moments of isomers using five HPGe detectors. g factors from 2000Io02 reanalyzed. Comparison with shell-model calculations.

^{86}Y Levels

E(level)[†]	J$^\pi$	T$_{1/2}$	Comments
0.0	4$^-$		
208.11 *10*	5$^-$	70 ns *7*	g=−0.083 *3* (2010Ru07,2000Io02) μ=−0.415 *15* (2010Ru07) T$_{1/2}$: from n$\gamma\gamma$(t) (2010Ru07).
218.27 *14*	8$^{(+)}$	47.2 min *4*	T$_{1/2}$: from multi-spectrum scaling (2010Ru07).
242.80 *10*	2$^-$	29 ns *4*	T$_{1/2}$: from nγ(t) (2010Ru07).
302.27 *12*	6$^+$	127 ns *14*	g=+0.63 *2* (2010Ru07,2000Io02) μ=+3.78 *12* (2010Ru07) T$_{1/2}$: from nγ(t) (2010Ru07).
303.27 *17*	7$^{(+)}$		
469.51 *22*			
476.07 *24*			
620.77 *24*			
661.95 *13*			
742.07 *24*			
850.42 *22*			
886.27 *21*	9$^{(+)}$		
900.18 *14*			
1202.94 *19*	7$^{(-)}$		
1317.0 *3*			
1325.38 *19*	10$^{(+)}$		
1408.57 *20*	9$^{(+)}$		
1494.08 *21*	8$^{(-)}$		
1855.4 *4*			
1955.18 *22*			
1987.38 *22*	11$^{(+)}$		
2042.67 *17*	9$^{(-)}$		
2259.08 *17*	10$^{(-)}$		
2351.78 *19*	11$^{(-)}$		
2521.5 *9*	12$^{(+)}$		
2757.8 *8*	11$^{(-)}$		
2913.5 *8*	12$^{(-)}$		
3090.6 *8*	12$^{(-)}$		
3189.4 *9*	13$^{(+)}$		
3302.1 *12*	13$^{(-)}$		
3454.4 *10*	13$^{(-)}$		
3877.8 *11*	14$^{(+)}$		
4010.8 *13*	14$^{(-)}$		
4073.4 *14*	14$^{(-)}$		
4192.0 *15*	15$^{(+)}$		
4961.6 *14*	15$^{(-)}$		
5430.1 *14*	16$^{(-)}$		

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$^{76}Ge(^{14}N,4n\gamma),^{73}Ge(^{16}O,p2n)$ 2009Ru03,2010Ru07 (continued)

^{86}Y Levels (continued)

E(level)†	J^π
6412.1 *16*	$17^{(-)}$
6779.0 *16*	$18^{(-)}$
7216.1 *19*	$19^{(-)}$

† From least-squares fit to Eγ values below 2500 keV excitation. Above this energy, level energies are taken from $^{52}Cr(^{37}Cl,2pn\gamma)$ experiment by 2009Ru03 (see the separate dataset).

$\gamma(^{86}Y)$

E_γ†	I_γ	E_i(level)	J^π_i	E_f	J^π_f	Mult.	δ	α‡	Comments
(10.2 *2*)		218.27	$8^{(+)}$	208.11	5^-	[E3]			
84.0 *1*	0.6 *3*	302.27	6^+	218.27	$8^{(+)}$				
85.0 *1*	6 *2*	303.27	$7^{(+)}$	218.27	$8^{(+)}$				
92.7 *1*	11 *3*	2351.78	$11^{(-)}$	2259.08	$10^{(-)}$	D(+Q)	0.00 *2*		A_2=−0.22 *4*; A_4=+0.03 *5*
94.1 *1*	3.6 *6*	302.27	6^+	208.11	5^-				
173.8 *2*	0.4 *1*	476.07		302.27	6^+				
177.1		3090.6	$12^{(-)}$	2913.5	$12^{(-)}$	D+Q	−0.3 *2*		A_2=+0.25 *8*; A_4=+0.03 *10*
208.1 *1*	100 *6*	208.11	5^-	0.0	4^-	M1+E2	+0.8 *+4−2*	0.044 *10*	A_2=+0.45 *5*; A_4=+0.04 *6* α(K)=0.039 *9*; α(L)=0.0048 *12*; α(M)=0.00082 *20* α(N)=0.00011 *3*; α(O)=6.5×10^{-6} *13* A_2 and A_4 from nγ coin data.
216.4 *1*	9 *1*	2259.08	$10^{(-)}$	2042.67	$9^{(-)}$	D(+Q)	+0.01 *2*		A_2=−0.20 *3*; A_4=−0.01 *4*
238.2 *1*	1.5 *3*	900.18		661.95					
242.8 *1*	1.2 *1*	242.80	2^-	0.0	4^-				
261.4 *2*	0.4 *1*	469.51		208.11	5^-				
303.9 *2*	0.5 *1*	2259.08	$10^{(-)}$	1955.18					
314.2		4192.0	$15^{(+)}$	3877.8	$14^{(+)}$	D+Q	−0.09 *2*		A_2=−0.37 *3*; A_4=+0.02 *4*
318.5 *2*	0.3 *1*	620.77		302.27	6^+				
332.6		3090.6	$12^{(-)}$	2757.8	$11^{(-)}$	D+Q	−0.08 *3*		A_2=−0.33 *5*; A_4=−0.03 *6*
359.5 *2*	2.2 *4*	661.95		302.27	6^+				
363.8		3454.4	$13^{(-)}$	3090.6	$12^{(-)}$				
364.4 *2*	4.9 *6*	2351.78	$11^{(-)}$	1987.38	$11^{(+)}$				
366.9		6779.0	$18^{(-)}$	6412.1	$17^{(-)}$	D(+Q)	+0.02 *2*		A_2=−0.18 *3*; A_4=−0.01 *4*
388.6		3302.1	$13^{(-)}$	2913.5	$12^{(-)}$				
437.1		7216.1	$19^{(-)}$	6779.0	$18^{(-)}$	D+Q	−0.16 *4*		A_2=−0.49 *6*; A_4=+0.08 *7*
439.8 *2*	3.3 *5*	742.07		302.27	6^+				
468.5		5430.1	$16^{(-)}$	4961.6	$15^{(-)}$	D+Q	−0.10 *3*		A_2=−0.37 *4*; A_4=+0.00 *5*
540.9		3454.4	$13^{(-)}$	2913.5	$12^{(-)}$	D+Q	−0.13 *4*		A_2=−0.41 *6*; A_4=−0.03 *8*
548.6 *2*	1.2 *3*	2042.67	$9^{(-)}$	1494.08	$8^{(-)}$				
556.4		4010.8	$14^{(-)}$	3454.4	$13^{(-)}$	D+Q	−0.15 *2*		A_2=−0.46 *2*; A_4=+0.06 *3*
561.8		2913.5	$12^{(-)}$	2351.78	$11^{(-)}$				
574.9 *2*	0.7 *1*	1317.0		742.07					
597.9 *2*	0.6 *3*	900.18		302.27	6^+				
634.1 *2*	2.2 *4*	2042.67	$9^{(-)}$	1408.57	$9^{(+)}$	D(+Q)	−0.1 *2*		A_2=+0.34 *8*; A_4=−0.09 *10*
642.3 *2*	1.2 *3*	850.42		208.11	5^-				
662.0 *2*	0.8 *3*	661.95		0.0	4^-				
662.0 *2*	7.3 *8*	1987.38	$11^{(+)}$	1325.38	$10^{(+)}$	D+Q	−0.05 *2*		A_2=−0.32 *3*; A_4=+0.06 *4*
668.0 *2*	3.1 *5*	886.27	$9^{(+)}$	218.27	$8^{(+)}$				
688.4		3877.8	$14^{(+)}$	3189.4	$13^{(+)}$	D+Q	−0.11 *3*		A_2=−0.38 *4*; A_4=−0.04 *5*

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^{76}Ge(^{14}N,4nγ),^{73}Ge(^{16}O,p2n) 2009Ru03,2010Ru07 (continued)

γ(^{86}Y) (continued)

E_γ[†]	I_γ	E_i(level)	J^π_i	E_f	J^π_f	Mult.	δ	Comments
692.2 *2*	1.3 *3*	900.18		208.11	5^-			
738.9		3090.6	$12^{(-)}$	2351.78	$11^{(-)}$	D+Q	−0.10 *2*	A_2=−0.36 *3*; A_4=−0.04 *4*
771.3		4073.4	$14^{(-)}$	3302.1	$13^{(-)}$	D+Q	−0.09 *5*	A_2=−0.36 *7*; A_4=+0.00 *9*
839.7 *2*	1.9 *3*	2042.67	$9^{(-)}$	1202.94	$7^{(-)}$	Q		A_2=+0.28 *5*; A_4=−0.05 *6*
850.5 *2*	2.8 *5*	2259.08	$10^{(-)}$	1408.57	$9^{(+)}$	D(+Q)	+0.03 *3*	A_2=−0.16 *4*; A_4=−0.03 *5*
888.2		4961.6	$15^{(-)}$	4073.4	$14^{(-)}$			
933.7 *2*	6.4 *8*	2259.08	$10^{(-)}$	1325.38	$10^{(+)}$	D(+Q)	0.0 *2*	A_2=+0.38 *3*; A_4=+0.00 *4*
950.8		4961.6	$15^{(-)}$	4010.8	$14^{(-)}$	D(+Q)	−0.04 *3*	A_2=−0.29 *5*; A_4=+0.07 *6*
994.8 *2*	3.2 *3*	1202.94	$7^{(-)}$	208.11	5^-	Q		A_2=+0.29 *7*; A_4=+0.00 *9*
1005.0 *3*	0.4 *1*	1855.4		850.42				
1026.4 *3*	4.2 *6*	2351.78	$11^{(-)}$	1325.38	$10^{(+)}$	D(+Q)	+0.01 *1*	A_2=−0.22 *2*; A_4=+0.04 *3*
1055.0 *3*	1.4 *3*	1955.18		900.18				
1101.1 *5*	1.3 *1*	1987.38	$11^{(+)}$	886.27	$9^{(+)}$	Q		A_2=+0.26 *8*; A_4=+0.03 *14*
1105.3 *4*	4.9 *9*	1408.57	$9^{(+)}$	303.27	$7^{(+)}$	Q		A_2=+0.30 *4*; A_4=−0.06 *5*
1107.1 *2*	56 *4*	1325.38	$10^{(+)}$	218.27	$8^{(+)}$	Q		A_2=+0.32 *1*; A_4=−0.07 *1*
1190.3 *3*	1.8 *3*	1408.57	$9^{(+)}$	218.27	$8^{(+)}$			
1190.8 *3*	1.8 *3*	1494.08	$8^{(-)}$	303.27	$7^{(+)}$			
1196.1		2521.5	$12^{(+)}$	1325.38	$10^{(+)}$	Q		A_2=+0.30 *1*; A_4=−0.06 *1*
1202.0		3189.4	$13^{(+)}$	1987.38	$11^{(+)}$	Q		A_2=+0.39 *7*; A_4=−0.05 *9*
1275.8 *3*	1.5 *3*	1494.08	$8^{(-)}$	218.27	$8^{(+)}$			
1348.9		6779.0	$18^{(-)}$	5430.1	$16^{(-)}$			
1356.3		3877.8	$14^{(+)}$	2521.5	$12^{(+)}$	Q		A_2=+0.34 *6*; A_4=−0.12 *8*
1372.8 *3*	1.8 *3*	2259.08	$10^{(-)}$	886.27	$9^{(+)}$	D(+Q)	−0.02 *3*	A_2=−0.26 *4*; A_4=+0.05 *6*
1419.3		5430.1	$16^{(-)}$	4010.8	$14^{(-)}$	Q		A_2=+0.43 *14*; A_4=+0.03 *18*
1432.2		2757.8	$11^{(-)}$	1325.38	$10^{(+)}$	D(+Q)	−0.02 *3*	A_2=−0.25 *4*; A_4=+0.02 *5*
1450.5		6412.1	$17^{(-)}$	4961.6	$15^{(-)}$	Q		A_2=+0.31 *15*; A_4=+0.05 *18*
1824.4 *4*	4.5 *9*	2042.67	$9^{(-)}$	218.27	$8^{(+)}$	D(+Q)	0.00 *2*	A_2=−0.23 *3*; A_4=+0.02 *4*

† Above 2500 keV excitation energy, γ-ray energies are taken from ^{52}Cr(^{37}Cl,2pnγ) experiment by 2009Ru03 (see separate dataset).

‡ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

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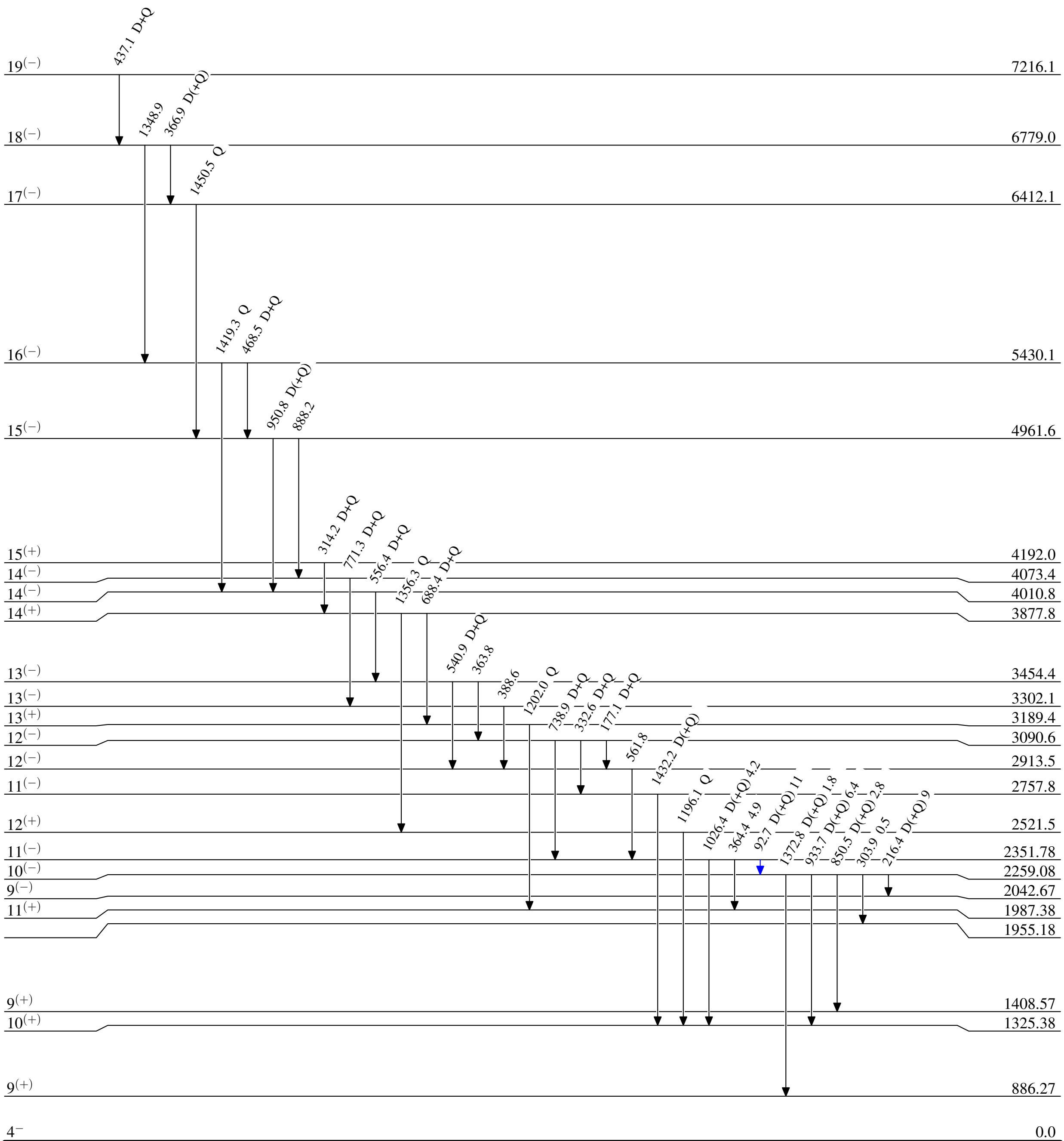
Level Scheme

Intensities: Relative I_γ

Legend

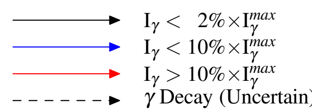
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$



$^{86}_{39}Y_{47}$

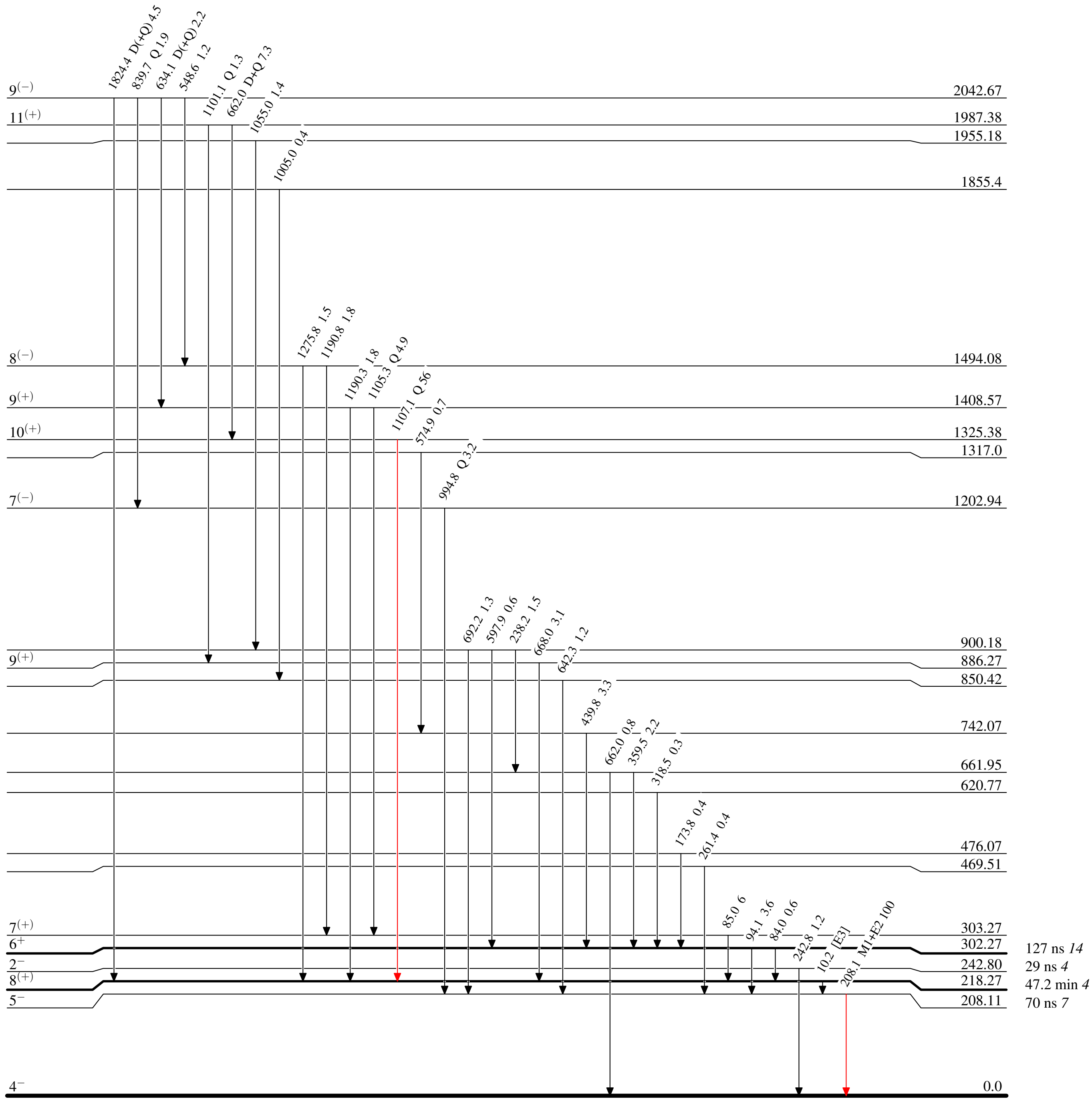
^{76}Ge(^{14}N,4nγ),^{73}Ge(^{16}O,p2n) 2009Ru03,2010Ru07

Legend



Level Scheme (continued)

Intensities: Relative I_γ



$^{86}_{39}Y_{47}$